

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	JUMA
Title	FILTER REINFORCED FILTER FOR MOLTEN METAL FILTRATION
Serial Number	10/516,443
371(c) Filing Date	30 November 2004
Art Unit	1797
Examiner	Kim, John
Attorney Docket No.	1489
To:	Mail Stop Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

Dear Sir:

I, Kassim Juma, hereby swear and state that:

1. I am the inventor of the subject matter of the above-identified patent application.
2. I have been active in research and development in the field of ceramics and/or metals for the last 30 years.
3. I received a Ph.D. degree in Ceramics from Sheffield University, which is located in Sheffield in the United Kingdom.
4. I am the author of 20 papers in the field of ceramics and/or metals.
5. I am listed as an inventor on 31 US patents and foreign patents, particularly relating to products and methods related to ceramics, metals and their processing.
6. I am very familiar with refractory filters as used in the casting of molten metals.
7. I have carried out and supervised numerous experimental and commercial trials concerning refractory filters.

*Juma*

8. I am co-inventor of subject matter described in U.S. Patent Application No. 10/362,751 ("the 751 application"), which was published as U.S. Patent Publication No. 2004/0128857 and issued as U.S. Patent No. 7,138,084 ("the '084 patent").

9. I am co-inventor of subject matter described in U.S. Patent Application No. 11/584,002 ("the '002 application"), which was published as U.S. Patent Publication No. 2007/0090047.

10. Carbon occurs in nature in three distinctive forms. As diamond it is highly crystallized in cubic structure, as graphite, also in crystallized form but in a hexagonal structure and thirdly in a glassy form with none crystallized structure. The three forms of carbon have wide differences in their physical characteristics despite the fact that all called carbon. It is therefore essential to state what type of carbon ones means when talking of carbon as a material or as a bonding medium. It is not only the physical properties that distinguish the three types of carbon from each other but also their precursors and their origin. Moreover, it is not possible to convert one type of carbon into another by any known physical or chemical means.

11. Graphitizable carbon may be used as a bonding material or binder in the formation of a filter for molten metal filtration only if it is fired in a non-oxidizing atmosphere.

12. The claims in the '084 patent do not specify the type of carbon present in the filter. Their undue breadth includes the diamond form of carbon. The examples teach only the use of RAUXOLIT binder in the process by which the product is formed.

13. RAUXOLIT is a brand name of a synthetic resin material which produces a glassy carbon on pyrolysis above 600°C. All synthetic resins as well as natural resins produce glassy carbon. Glassy carbon is low density, porous, with low thermal shock resistance, low oxidation resistance and much weaker than graphitizable carbon processed according to the present invention.

14. High melting pitch serves as the binder in the present invention. High melting pitch contains graphitizable carbon. A generalized teaching of the use of pitch as a replacement for a synthetic resin is not a teaching or suggestion of the use of high-melting pitch in the present invention because high-melting pitch is instrumental in the retention of geometrical shape during pyrolysis in the present invention, which is a result that is not obtained by the use of generic pitch.

*June*

15. The subject of the present application, in which a slurry containing 15% or less bonding material or binder is used in the formation of a filter for molten metal filtration, was not viewed as viable by the inventors named in the '751 and '002 applications at the time the applications were filed.

16. A good and usable filter which is produced from graphitizable carbon may contain as little as 5% carbon while those bonded by glassy carbon have to contain around 50%. Consequently, filters produced from graphitizable carbon are stronger and less susceptible to oxidation during use than those bonded with glassy carbon bonding. The two types of filters differ notably in their rate of shrinkage during the pyrolysis process. While graphitized carbon filters exhibit minimal shrinkage, glassy carbon filters show up to 8% shrinkage. The high shrinkage rate during processing of glassy carbon filters makes it very difficult to make large filters. Consequently, no large filters can be made from glassy carbon bonded filters. Filters up to 300 mm are currently being made from graphitizable carbon, and are being sold and successfully used.

17. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 28/04/2008

Kassim Juma

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